Remarks

The Office Action mailed April 14, 2004 has been received and reviewed. Claims 1, 21, 40, 43, 47, and 51 have been amended. The pending claims are claims 1, 3-5, 7-21, 23-25, and 27-51. Reconsideration and withdrawal of the rejections are respectfully requested in view of the following remarks.

The amendments to the independent claims made herein are intended to clarify the claims, however, the scope of the claims are intended to be the same after the amendment as it was before the amendment. The amendments have not been made to overcome the art cited in the pending office action.

The 35 U.S.C. §102 Rejection

The Examiner rejected claims 1, 3-5, 7-13, 16-17, 19, 21, 23-25, 27-33, 36-38, 40-41 and 43-51 under 35 U.S.C. §102(b) as being anticipated by Harrow et al. (U.S. Patent No. 5,375,199). Applicants respectfully traverse this rejection. For a claim to be anticipated under 35 U.S.C. § 102(b), each and every element of the claim must be found in a single prior art reference. *See* M.P.E.P. § 2131.

In each of independent claims 1, 21, 40, 43, 47, and 51, Applicants teach a computer implemented graphical user display and/or method for providing real-time process information to a user for a process that is operable under control of one or more process variables. The one or more process variables include high and low process limit values associated therewith. The graphical user display includes one or more graphical devices, where each graphical device corresponds to a process variable. The graphical device for a corresponding process variable includes a display of a gauge axis and a first and second pair of high and low elements. The first pair of high and low limit elements are representative of user set engineering hard high and low limit values for the corresponding process variable that define a range in which operator set high and low limit values are set. The second pair of high and low limit elements are representative of the operator set high and low limit values for the corresponding process variable which define a range in which the process is free to operate; wherein each of the operator set high and low

limit values are adjustable so as to exert influence on the process. The first and second pair of high and low limit elements are displayed on the gauge axis. A graphical shape is displayed along the gauge axis representative of a value of the corresponding process variable relative to the process limit values.

It is to be noted that certain terms used in the claims have been further defined by previous amendments as requested by the Examiner even though such terms had already been defined in the specification. For example, the following description is given in the specification for various "limit" terms:

> As used herein, engineering physical limit values refer to limit values that define the physical limits of a piece of equipment or instrumentation. They represent the widest possible range of meaningful quantification of a process variable. For example, there may be engineering physical limits to measurements that a sensor may be able to provide.
>
> As used herein, engineering hard limit values are those limit values set by a user, particularly a control engineer, to establish a range over which an operator or another user can safely set operator set limit values.
>
> As used herein, operator set limit values are limit values through which operators exert influence on the controller 14. Such limits establish the range in which the control solution is free to act when it is afforded sufficient degrees of freedom.
>
> Lastly, as used herein, optimization soft limits, or otherwise referred to herein as delta soft bands, are pseudo limits describing an offset within the operator set limits that the optimization calculations will attempt to respect.

Applicants respectfully submit that Harrow fails to describe all the claim limitations of the independent claims 1, 21, 40, 43, 47, and 51. For example, Harrow fails to describe displaying a first pair of high and low limit elements representative of user set engineering hard high and low limit values for the corresponding process variable that define a range in which operator set high and low limit values are set **and** fails to describe a second pair of high and low limit elements representative of operator set high and low limit values for the corresponding process variable which define a range in which the process is free to operate (i.e., each of the operator set high and low limit values being adjustable so as to exert influence on the process), as recited in each of such claims.

Harrow recites a system monitoring device that displays historical or real time

information and also allows a user to set, via direct manipulation, a range of values for use by the system. For example, a user interface allows the user to expand the value of an interactive icon 200. The exemplary interactive icon 200 is illustrated in its expanded state on the graph in FIG. 13A where the user can move the range of values along the y-axis by dragging the slider 202 of the interactive icon 200 to change values associated with the interactive icon 200. Harrow indicates that the interactive icon 200 . . . allows a user to set a range of values in relationship to graphically presented data. (Col. 17, line 68 – Col. 18, line 2). In its default condition, the indicator bar 204 of the interactive icon supplies a single crossing threshold represented by a thin line (Col. 18, lines 12-16) for a variable (i.e., CRC errors per hour). Thus, the indicator bar 204 provides a single limit value for a particular variable, i.e., CRC errors per hour.

According to Harrow, a user can expand the value of the interactive icon 200 (i.e., the indicator bar 204) into a range of values so that the single limit value for the variable (i.e., CRC errors per hour) is a range designated for control of an alarm. For example, 206 in Figure 13A of Harrow indicates that "46" is the value at which "SOUND ALARM WHEN VALUE RISES ABOVE", and 208 in Figure 13A indicates that "26" is the value at which "CANCEL ALARM WHEN VALUE FALLS BELOW". As such, the values shown at 206 and 208 of Harrow represent an expanded range of values for a single operator limit value used to provide alarm function. In other words, Harrow provides an alarm range at the upper operator limit for the variable being monitored (e.g., CRC errors per hour). Harrow does not show "operator set high and low limit values."

Further, and in addition, Harrow does not describe operator set high and low limit values that are adjustable so as to each exert influence on the process. The limits discussed in Harrow are clearly only focused on a single operator limit (i.e., a high limit designated as line 204) for a variable (e.g., CRC errors per hour). A user can provide a range at this high limit to control some other activity (i.e., an alarm) through the designation of several values (i.e., 206 and 208) at the single operator limit, but there is no description of operator set high and low limit values that establish the range in which the control solution is free to act when it is afforded sufficient

degrees of freedom. In other words, the values in Harrow which according to the Examiner teach the operator set high and low limit values are only pertinent to a single operator limit and an alarm range associated therewith, and not operator set high and low limit values that are each adjustable so as to each exert influence on the process.

Contrary to Harrow, the present invention provides the second pair of high and low limit elements representative of operator set high and low limit values. As indicated in the claims as amended, such operator set limit values are limit values through which operators exert influence on the controller. Such limits establish the range in which the control solution is free to act when it is afforded sufficient degrees of freedom. The operator set limit values fall within a range established by the user set engineering hard limit values. In other words, the engineering hard limit values are those limit values set by a user (as described in the claims as amended), particularly a control engineer, to establish a range over which an operator or another user can safely set operator set limit values.

In addition to not showing the operator set high and low limit values, Harrow does not show the user set engineering hard limit values. The Examiner equates the values 0 and 80 of the scale shown in Figure 13A to the engineering hard limit values described in the claims. This is clearly inappropriate. The values 0 and 80 on the scale have not been described by Harrow in any manner such that they can be equated with engineering hard limit values that establish a range over which an operator or another user can safely set operator set limit values (e.g., engineering hard limit values set by a user, particularly a control engineer). The 0 and 80 are merely part of a scale and are not functional limit values. They are not indicated as being a limit on anything, upper or lower, for a process variable.

As such, Harrow fails to describe, besides other things, both a first pair of high and low limit elements representative of engineering hard high and low limit values and a second pair of high and low limit elements representative of operator set high and low limit values for a corresponding process variable, as recited in each independent claim.

Further, at least with reference to claims 40 and 51, Harrow fails to describe a display that provides both manipulated variables and controlled variables with each of a plurality of one

or more graphical devices (including the components recited in the respective claims) displayed in proximity a corresponding manipulated or controlled variable. In particular, with respect to claim 51, Harrow in no manner describes a matrix display having the manipulated variables displayed along a first axis thereof and the controlled variables displayed along a second axis thereof, and further wherein the method includes displaying a graphical device in proximity to each of the manipulated variables and controlled variables in such a matrix display. The language cited by the Examiner at column 18, lines 23-58 with reference to Figures 13A and 13B in no manner addresses the display of a graphical device in proximity to each of multiple manipulated variables and controlled variables.

Further, at least with reference to claims 43 and 47, Harrow fails to describe a display of a graphical shape along the gauge axis representative of a value of the corresponding process variable relative to the high and low process limit values and a graphical symbol representative of an optimization characteristic for the corresponding process variable along the gauge axis. The figure cited by the Examiner (i.e., Figure 13A) in no manner addresses the display of such elements. Particularly, Figure 13A does not display a graphical symbol representative of an optimization characteristic for the corresponding process variable along the gauge axis.

Yet further, the Examiner uses the terms controlled variables and manipulated variables in parenthesis at various locations in the rejection. It is believed that the Examiner is using such language incorrectly in the rejection as such controlled variables and manipulated variables are process variables as described in the claims and are not equated with the graphical devices but rather, for example, a graphical device is displayed in proximity to each of a manipulated variable or a controlled variable (e.g., the variables may be along two axis such as in the matrix display recited in certain claims).

For at least the above reasons, independent claims 1, 21, 40, 43, 47, and 51 are not obvious in view of the cited references.

With respect to claims 3-5, 7-13, 16-17, 19, 23-25, 27-33, 36-38, 41, 44-46, and 48-50, Applicants respectfully submit that these claims are also patentable as further limitations of respective patentable base independent claims from which they directly or indirectly depend.

Furthermore, such claims are each patentable over Harrow based on the subject matter recited respectively therein and Applicant generally traverses the allegations that such claims are anticipated by Harrow. For example, various remarks are further provided below with respect to many of such claims, but the remarks are limited to just a few of the elements that are not described in Harrow and are not to be taken as being the only such elements which are not described by Harrow.

For claims 4 and 24, Applicants respectfully submit that the Examiner fails, besides other things, to show where Harrow describes a single pair of parallel lines on a gauge axis that represent both an engineering hard high and low limit values and an operator set high and low limit values, as recited in claims 4 and 24. This is clearly not shown when such engineering hard high and low limit values and an operator set high and low limit values are not shown.

For claims 5 and 25, Applicants respectfully submit that the Examiner fails, besides other things, to show where Harrow describes different length lines for the engineering hard high and low limit values and the operator set high and low limit values, as recited in claims 5 and 25. The Examiner again cites Figure 13A to show such elements. However, as described above, Figure 13A does not even show such engineering hard high and low limit values and operator set high and low limit values. Further, even the lines which the Examiner alleges are representative of such engineering hard high and low limit values and operator set high and low limit values appear to be generally shown as being of equal length.

For claims 7 and 27, the Examiner asserts that Figure 13A of Harrow demonstrates the claimed elements. Applicants respectfully traverse these assertions. There is nothing in Harrow that would show the graphical shape positioned adjacent one of the pair of high and low limit elements when the value for the corresponding process variable is within a certain range of the engineering hard high/low limits.

Further, the Examiner indicates that the adjacent position is inherent. A *prima facie* case of inherency can be rebutted by evidence showing that the prior art does not necessarily possess the characteristics of the claimed limitations. Under the principles of inherency, if the prior art, in its normal and usual operation, would necessarily perform the method claimed, then the

method claimed will be considered to be anticipated by the prior art device. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *See In re Rijckaert*, 9 F.3d 1531, 1534, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art) (see M.P.E.P §2112).

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. (M.P.E.P §2112). It is respectfully submitted that the Examiner has not met the burden of providing a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the cited documents. In other words, Applicant submits that the position of the graphical shape as alleged by the Examiner does not necessarily flow from the teachings of the cited documents as there are various other positions or manners of showing that the value for the corresponding process variable is within a certain range of the engineering hard high/low limits.

For claims 8 and 28, the Examiner asserts that Harrow demonstrates the subject matter recited in claims 8 and 28. Applicants respectfully traverse these assertions. Claims 8 and 28 state in part that the graphical shape is positioned outside of the parallel lines of the second pair of high and low limit elements when the value for the corresponding process variable is outside the operator set high and low process limit values by a predetermined percentage. As Harrow fails to teach or suggest a pair of high and low elements representative of operator set high and low process limit values, the other limitations of this claim cannot be met.

For claims 9 and 29, the Examiner asserts that Harrow shows a graphical symbol representative of an optimization characteristic in column 7, line 55 through column 8, line 5. However, such language only deals with manipulation of an interactive icon and has nothing to do with an optimization characteristic (e.g., minimization or maximization) of a process variable.

For claims 10, 11, 30, 31, 44-45, and 48-49, the Examiner states that Harrow shows a

graphical symbol representative of a corresponding process variable to be maximized or minimized as described in such claims. The Examiner indicates that the "0" and the "80" of Figure 13A show such a graphical symbol. Applicants respectfully traverse these assertions. The 0 and 80 of Figure 13A are merely part of a scale representative of the number of CRC errors. Such numbers do not provide any information to a user as to whether the process variable is to be maximized or minimized. They merely show a range of values for the number of CRC errors.

For claims 12, 32, 46, and 50, the Examiner alleges Harrow discloses the graphical symbol representative of a corresponding process variable to be held at a resting value. Applicant respectfully traverses such assertions and in response asserts that no such graphical symbol provides such a representation. The Examiner cites column 18, lines 15-42 of Harrow in support of this rejection. However, such language only deals with an alarm and has nothing to do with a process variable to be held at a resting value.

For claims 13 and 33, the Examiner alleges Harrow discloses the graphical symbol representative of a corresponding process variable being constrained to a set point. Applicant respectfully traverses such assertions and in response asserts that no such graphical symbol provides such a representation. The Examiner cites column 3, lines 10-35 of Harrow in support of this rejection. However, such language has nothing to do with a set point of a process variable.

For claims 19 and 41, the Examiner continues to assert that Harrow et al. discloses a matrix display having the manipulated variables displayed along a first axis thereof and the controlled variables displayed along a second axis thereof, wherein each of the manipulated and controlled variables includes a graphical device displayed in proximity thereto. Applicants respectfully traverse the rejection. Nothing in the references even comes close to showing such a matrix display. The Examiner cites column 18, lines 16-32 and Figure 11B of Harrow in support of this rejection. However, such language deals with an interactive icon that can be dragged along an axis and has nothing to do with the matrix display of manipulated and controlled variables recited in the rejected claim language.

Applicants respectfully submit that Harrow fails to teach the above-recited subject matter of claim 19 and 41. Rather, Harrow teaches a "graphic display of data" having Cartesian coordinates defining an independent axis "CRC Errors" and a dependent axis "Time" on which a graphical indication of the CRC errors per hour are plotted (Col. 18, lines 16-32). As such, Harrow does not describe a matrix display with manipulated variables displayed along a first axis and the controlled variables displayed along a second axis, or a graphical device displayed in proximity to each of the manipulated and controlled variables, as recited in claim 19 and 41.

For claim 38, the Examiner asserts that Harrow describes such limitations. Applicants respectfully traverse the rejection and submit that, as set forth above, Harrow does not teach or suggest displaying a matrix display having manipulated variables displayed along a first axis of the matrix and the controlled variables displayed along a second axis of the matrix.

It is further noted that the Examiner in rejecting claim 38 indicates that Harrow describes a continuous multi-variable process operable under control of at least manipulated and controlled variables at a process plant. However, in the obviousness rejection of claims 18, 20, 39, and 42, the Examiner indicates that Harrow does not described such limitations. It is respectfully requested that such incompatible language be reconsidered. It is Applicants' position that Harrow does not show such elements.

Based on at least the forgoing reasons, the Office Action fails to establish that the pending claims 1, 3-5, 7-13, 16-17, 19, 21, 23-25, 27-33, 36-38, 40-41, and 43-51 are anticipated by Harrow. Applicants respectfully request reconsideration and allowance of such claims.

The 35 U.S.C. §103 Rejection

The Examiner rejected claims 15 and 35 under 35 U.S.C. §103(a) as being unpatentable over Harrow et al. (U.S. Patent No. 5,375,199). The Examiner further rejected claims 18, 20, 39 and 42 under 35 U.S.C. §103(a) as being unpatentable over Harrow et al. (U.S. Patent No. 5,375,199) in view of van Weele (U.S. Patent 5,631,825).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the

knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations.

With respect to claims 15 and 35, the Examiner uses official notice to provide a circular shape in place of a rectangular shape of Figure 13A of Harrow. However, the rectangular shape of Harrow along the gauge axis (e.g., the bar graph element) would not appear to be modifiable to a circular shape without changing the nature of the bar graph. In other words, such a modification would not be obvious in view of Harrow and the official notice taken by the Examiner.

With reference to claims 18, 20, 39, and 42, Applicants respectfully traverse the rejections and repeat the arguments presented above given for the independent claims from which these claims directly or indirectly depend. Such claims are also allowable in view of their own limitations.

Further, in addition to Harrow failing to teach or suggest all of the claim limitations as clearly set forth above, there is no teaching or suggestion in either of the references that would motivate one skilled in the art to make a modification to Harrow using the teachings of van Weele as alleged by the Examiner so as to arrive at the present invention. The Examiner alleges that it would have been obvious to one skilled in the art, having the teachings of Harrow and van Weele before them to modify Harrow with the multi-variable process elements shown in van Weele "in order to provide data input means for selecting one of a set of preselected process primitives, and means for indicating a value for the selected process primitive and substituting the input value for that primitive as the value to be monitored and controlled by the PPC."

However, as explained above, neither references show user defined operator high and low limits as indicated by the Examiner, nor engineering hard high and low limits elements. As such, no modification would provide the present invention as described in the accompanying claims and there is no motivation to perform such a modification.

Applicants respectfully request reconsideration and allowance of claims 15, 18, 20, 35, 39, and 42.

Allowable Subject Matter

Applicants acknowledge the Examiner's indication that claims 14 and 34 are objected to as being dependent on a rejected base claim, but that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicants have not rewritten the claims in independent form as it is believed that the claims upon which they depend are also in allowable condition. However, Applicants reserve the right to rewrite such claims at a later date.

Summary and Request for Examiner Interview Prior to Disposition of Case

It is respectfully submitted that the pending claims are in condition for allowance and notification to that effect is respectfully requested. It would appear that the Examiner is still unclear as to the limitations of the present invention and does not recognize the differences between Applicants' invention and the cited references. It is requested that the Examiner contact Applicants' Representatives at the below-listed telephone number if the case is not allowed to discuss the prosecution of this application when it is taken up for consideration.

CERTIFICATE UNDER 37 C.F.R. 1.8:

The undersigned hereby certifies that this paper is being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 13 day of August, 2004, at 7:55 A.M. (Central Time).

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13 Aug 2004

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